



# NITHIN FRANCIS

## SUMMARY

Passionate Embedded Systems Engineer with over three years of experience in microcontroller programming, real-time embedded systems, and hardware interfacing. Skilled in working with microcontrollers such as PIC, dsPIC, STM32, and MS51PC0AE, with expertise in communication protocols like I2C, SPI, UART, RS-232, RS-485, and Ethernet. Proficient in firmware development, peripheral interfacing, and debugging using MPLAB X IDE and ICD 4. Experienced in designing and optimizing embedded solutions involving ADC/DAC integration, PWM control, EEPROM data management, and real-time signal processing.

## EXPERIENCE

### **Embedded System Engineer**, March/2024 – Present

#### RATO COMMUNICATIONS AND ELECTRONICS PVT.LTD (RACE), Hyderabad, India.

RATO is engaged in Design, Development, Manufacturing and Marketing several products with emphasis on these products viz. Power supplies, Signal conditioning Modules, Interface modules, Digital Panel meters, Custom built products and Nuclear Instruments.

- C and Embedded C
  - Embedded Operating System
  - Bare-Metal Programming
  - RTOS
  - Debugging and troubleshooting
  - Microcontroller: STM32F407VG, ESP 32
  - Communication Protocols: SPI 12C, UART
  - Linux Device Drivers
  - IoT
  - Hard and Software integration
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- Developed and optimized firmware for microcontrollers, including **PIC16F, dsPIC33F, STM32 and MS51PC0AE**.
  - Designed and implemented **real-time embedded systems**, focusing on **ADC/DAC interfacing, EEPROM data storage**.
  - Worked extensively with **communication protocols** such as **I2C, SPI, UART (RS-232, RS-485), and Ethernet**, successfully interfacing peripherals like **MCP3421 ADC, DAC7574, W5500 Ethernet controller, and USR-TCP232-T2**.
  - Developed **custom drivers** for external components such as **shift registers (74HC595) for 7-segment displays and 8x8 LED matrices**, ensuring efficient multiplexing and data handling.
  - Implemented **real-time data acquisition and processing**, optimizing system response times using **TIMERS for desired intervals**.
  - Acquired Debugging and programming of embedded systems using **MPLAB X IDE, ICD 4, and various debugging tools**, ensuring system stability and reliability.
  - Worked on **power cycle data retention**, ensuring stored values were correctly retrieved upon system restart using EEPROM.
  - Provided technical guidance and collaborated with teams on **debugging, and embedded software optimization**.

## CONTACT

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Location : Hyderabad, India

## SOFTWARE SKILLS

- Problem-Solving
  - Strategic Planning
  - Leadership
  - Adaptability
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- English
  - Malayalam
  - Hindi
  - Tamil

## STRENGTH

- Problem-Solving
- Strategic Planning
- Leadership
- Adaptability

## LANGUAGES

### **Embedded Architect**, June/2023 - Dec/2023

#### ESYMIth Solutions, Bangalore, India.

The company is engaged in providing services for low level firmware and hardware designs.

- provided durable solutions for real time problems in firmware industry.
- Implemented customized firmware projects for clients.

### **Project Coordinator**, Jan/2021- July/2022

#### NEZZT Solution, Kottayam, India.

Leading startup company developing product engineering and software services.

- Ensuring, implementing and allocation of resources for different projects.
- Ensuring completion of task within speculated time frame and budget.
- **Monitoring the daily progress of projects.**
- Scheduling client meetings.

## **HOBBIES**

- Fitness Classes
- Personal Training
- Travelling
- Strength Training

## **PROJECTS**

### **Developing RTOS-Aware Device Drivers**

Modified the bare-metal device drivers of STM32-HAL, to convert them to RTOS-aware device drivers, using services of FreeRTOS. In addition, we need to write RTOS-aware applications to test these device drivers.

### **Automatic Railway Crack Detection**

In the proposed system railway crack was detected automatically using a vehicle. Detection is done through an ultrasonic sensor attached to the vehicle. The position of the crack is identified using GPS and the information is sent by using GSM. An LCD is used to represent the current status of the vehicle.

### **Smart Bin**

In this, waste bin are interfaced with the micro-controller (ATMEGA16) based system. The waste separation and a level sensor for knowing the level is done by IR transceiver which will be displayed on the LCD along with which an alarm is produced.

## **EDUCATION**

**Post Graduate Diploma :** EMBEDDED SYSTEM DESIGN,2023

**CDAC - Bengaluru, Karnataka**

**B.Tech :** Electronics & Communication Engineering,2017

**MG UNIVERSITY - Kottayam, Kerala**